

AMENDMENTS TO THE CLAIMS

Please amend claims 1, 15, 16, 18, 21, 25-27, 30, 33, and 36-38; add new claims 39-52; and cancel claims 14 and 35 as set forth below. This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently amended) A method for facilitating adaptive transmissions by a base station in a multi-carrier system, multi-dimension domain, where a total available bandwidth is split into a set of subbands, each subband of the set of subbands comprising at least one subcarrier, the method comprising:

- providing data to be transmitted to at least one transmission target;
- determining whether likely trustworthy channel quality data is obtainable;

when likely trustworthy channel quality data is not obtainable, determining at least whether, how, and when to transmit at least a portion of the data pursuant to a first transmission selection mode receiving a first channel quality report comprising an overall channel quality indicator, selecting a first set of subcarriers for transmission, and selecting a first modulation and coding scheme for the selected set of subcarriers based on the overall channel quality indicator;

when likely trustworthy channel quality data is obtainable, at least attempting to obtain channel quality data receiving a second channel quality report comprising at least one subband channel quality indicator, selecting a second set of subcarriers within at least one subband for transmission based on the at least one subband channel quality indicator, and selecting a second modulation and coding scheme for at least one of the at least one subband selected for transmission based on a corresponding at least one subband channel quality indicator;

- transmitting a resource allocation control channel comprising a selected one of the first modulation and coding scheme and the second modulation and coding scheme, and the selected set of subcarriers; and

- transmitting at least a portion of the data on subcarriers within the resource allocation using the selected one of the first modulation and coding scheme and the second modulation and coding scheme.

2. (Original) The method of claim 1 wherein determining whether likely trustworthy channel quality data is obtainable further includes determining whether channel quality data would likely be accurate at a time when used.

3. (Original) The method of claim 2 wherein determining whether channel quality data would likely be accurate at a time when used includes determining whether channel quality data would likely be accurate at a time when used for each of a plurality of sub-carriers.

4. (Original) The method of claim 1 wherein determining whether likely trustworthy channel quality data is obtainable includes obtaining data that tends to reflect at least a channel coherence time attribute of the transmission target.

5. (Original) The method of claim 4 wherein obtaining data that tends to reflect at least a channel coherence time attribute of the transmission target includes obtaining data that tends to reflect at least a channel coherence time attribute of the transmission target comprising at least one of a velocity of the transmission target, a geographic location of the transmission target, Doppler power spectrum estimations, maximum Doppler frequency estimations, time based comparisons of channel frequency response, and a cruise control setting that corresponds to the transmission target.

6. (Original) The method of claim 4 wherein obtaining data that tends to reflect at least a channel coherence time attribute of the transmission target includes accessing previously acquired data.

7. (Original) The method of claim 5 wherein obtaining data that tends to reflect at least a channel coherence time attribute of the transmission target includes acquiring new data.

8. (Original) The method of claim 5 wherein determining whether likely trustworthy channel quality data is obtainable includes obtaining data that tends to reflect a rate of change of channel characteristics as pertains to the transmission target.

9. (Original) The method of claim 8 wherein obtaining data that tends to reflect a rate of change of channel characteristics as pertains to the transmission target includes receiving a single bit that comprises the data.

10. (Original) The method of claim 8 wherein obtaining data that tends to reflect a rate of change of channel characteristics as pertains to the transmission target includes obtaining data that tends to reflect a rate of change of frequency dimension channel characteristics.

11. (Original) The method of claim 8 wherein obtaining data that tends to reflect a rate of change of channel characteristics as pertains to the transmission target includes obtaining data that tends to reflect a rate of change of time dimension channel characteristics.

12. (Original) The method of claim 4 wherein obtaining data that tends to reflect at least a channel coherence time attribute of the transmission target includes receiving a transmission from the transmission target that includes information regarding the channel coherence time attribute.

13. (Cancelled)

14. (Cancelled)

~~15.~~¹³ (Currently Amended) The method of claim 1 wherein ~~using the channel quality data to determine whether, how, and when to transmit at least a portion of the data pursuant to a second transmission selection mode includes~~ when the likely trustworthy channel quality data is not obtainable, the selecting the set of subcarriers and the selecting a modulation and coding scheme further comprises determining not to transmit at least a portion of the data.

~~16.~~²⁰ (Currently Amended) A method for facilitating adaptive transmissions in a multi-carrier, multi-dimension domain, comprising:

- providing data to be transmitted to at least one transmission target;
- determining whether likely trustworthy channel quality data is obtainable;
- when likely trustworthy channel quality data is not obtainable, ~~determining at least whether, how, and when to transmit at least a portion of the data pursuant to a first transmission selection mode~~ selecting a first modulation and coding scheme based upon an overall average channel quality indicator for a plurality of communications signal carriers to use when transmitting at least part of the data to a first given transmission target;
 - when likely trustworthy channel quality data is obtainable, at least attempting to obtain channel quality data;
 - when channel quality data is obtained, using the channel quality data at least a channel quality indicator information for at least some individual carriers to select a second modulation and coding scheme to use when transmitting at least part of the data to a second given transmission target, the second modulation and coding scheme being selected to ~~determine at least whether, how, and when to transmit at least a portion of the data pursuant to a second transmission selection mode, wherein using the channel quality data to determine whether, how, and when to transmit at least a portion of the data pursuant to a second transmission selection mode includes~~ selecting a particular modulation and coding scheme from amongst a plurality of candidate modulation and coding schemes.

~~17.~~²¹ (Original) The method of claim ~~16~~²⁰ wherein selecting a particular modulation and coding scheme from amongst a plurality of candidate modulation and coding schemes includes selecting a particular modulation and coding scheme based at least in part

upon individual subband channel quality indicator information for a plurality of subbands.

~~18.~~²² (Currently amended) The method of claim ~~1~~²⁰ wherein selecting the first modulation and coding scheme ~~determining at least whether, how, and when to transmit at least a portion of the data pursuant to a first transmission selection mode~~ includes selecting a particular modulation and coding scheme from amongst a plurality of candidate modulation and coding ~~scheme~~ schemes.

~~19.~~²³ (Original) The method of claim ~~18~~²² wherein selecting a particular modulation and coding scheme from amongst a plurality of candidate modulation and coding schemes includes selecting a particular modulation and coding scheme based at least in part upon channel quality indicator information as averaged across a plurality of subbands.

~~20.~~²⁴ (Previously presented) A method for facilitating adaptive transmissions in a multi-carrier, multi-dimension domain, comprising:

- providing data to be transmitted to at least one transmission target;
- determining whether likely trustworthy channel quality data is obtainable;
- when likely trustworthy channel quality data is not obtainable, determining at least whether, how, and when to transmit at least a portion of the data pursuant to a first transmission selection mode;
- when likely trustworthy channel quality data is obtainable, at least attempting to obtain channel quality data;
- when channel quality data is obtained, using the channel quality data to determine at least whether, how, and when to transmit at least a portion of the data pursuant to a second transmission selection mode, wherein using the channel quality data to determine whether, how, and when to transmit at least a portion of the data pursuant to a second transmission selection mode includes selecting a first modulation and coding scheme for use with a first carrier and a second modulation and coding scheme for use with a second carrier to transmit at least a portion of the data.

~~21.~~²⁵ (Currently amended) The method of claim ~~1~~²⁴ ~~20~~ wherein at least attempting to obtain channel quality data includes:

- transmitting a signal to the transmission target; and
- receiving a response from the transmission target, which response includes channel quality data.

~~22.~~²⁶ (Original) The method of claim ~~21~~²⁵ wherein transmitting a signal to the transmission target includes transmitting a fast sounding channel evaluation signal such that the transmission target can evaluate a time-frequency response of the multi-carrier domain.

~~23.~~²⁷ (Original) The method of claim ~~22~~²⁶ wherein receiving a response from the transmission target, which response includes channel quality data, includes receiving a response from the transmission target, which response includes individual channel quality indicator information for at least some carriers in the multi-carrier domain.

~~24.~~²⁸ (Original) The method of claim ~~21~~²⁵ wherein receiving a response from the transmission target, which response includes channel quality data further comprises receiving a response from the transmission target, which response includes at least frequency domain channel quality data.

~~25.~~²⁹ (Currently amended) A method for facilitating adaptive transmissions in a multi-carrier, multi-dimension domain, comprising:

- providing data to be transmitted to at least one transmission target;
- determining whether likely trustworthy channel quality data is obtainable;
- when likely trustworthy channel quality data is not obtainable, selecting a first modulation and coding scheme based upon an overall average channel quality indicator for a plurality of communications signal carriers to use when transmitting at least part of the data to the at least one transmission target ~~determining at least whether, how, and when to transmit at least a portion of the data pursuant to a first transmission selection mode;~~
- when likely trustworthy channel quality data is obtainable, at least attempting to

obtain channel quality data;

- when channel quality data is obtained, using at least a channel quality indicator information for at least some individual carriers to select a second modulation and coding scheme to use when transmitting at least part of the data to the at least one transmission target using the channel quality data to determine at least whether, how, and when to transmit at least a portion of the data pursuant to a second transmission selection mode;

wherein selecting a first modulation and coding scheme and using at least a channel quality indicator information for at least some individual carriers to select a second modulation and coding scheme determining at least whether, how, and when to transmit at least a portion of the data pursuant to the first transmission selection mode and the second transmission selection mode both include in all cases where data is transmitted transmission of data transmitting at least a portion of the data to the at least one transmission target within a frame of constant size.

³⁰
~~26.~~ (Currently amended) The method of claim ~~25~~²⁹ wherein using the channel quality indicator information to select a second modulation and coding scheme data to determine at least whether, how, and when to transmit at least a portion of the data pursuant to a second transmission selection mode includes using the channel quality indicator information data to complete a determination, prior to a next data transmission opportunity, of at least whether, how, and when to transmit at least a portion of the data to be transmitted.

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~~27.~~ (Currently amended) The method of claim ~~25~~²⁹ wherein using the channel quality indicator information to select a second modulation and coding scheme data to determine at least whether, how, and when to transmit at least a portion of the data pursuant to a second transmission selection mode includes using the channel quality indicator information data to determine at least whether, how, which transmitter to use, and when to transmit at least a portion of the data pursuant to a the second modulation and coding scheme transmission selection mode.

³²
~~28.~~ (Original) A method for facilitating adaptive transmissions in a multi-

carrier communications system comprising:

- providing a plurality of communications signal carriers and a plurality of modulation and coding schemes;

- providing data to be transmitted to a plurality of transmission targets;

- determining whether likely trustworthy channel quality data is obtainable for the transmission targets by accessing data that tends to reflect a rate of change of channel characteristic as pertains to the transmission targets;

- when likely trustworthy channel quality data is not obtainable for a first given transmission target, selecting a first modulation and coding scheme based upon overall average channel quality indicator for the plurality of communications signal carriers to use when transmitting at least part of the data to the first given transmission target;

- when likely trustworthy channel quality data is obtainable for a second given transmission target, accessing at least channel quality data that includes channel quality indicator information for at least some individual carriers of the multi-carrier communication system;

- using at least the channel quality indicator information for at least some individual carriers to select a second modulation and coding scheme to use when transmitting at least part of the data to the second given transmission target.

~~29.~~ ³³ (Original) The method of claim ~~28~~ ³² wherein:

- selecting a first modulation and coding scheme based upon overall average channel quality indicator for the plurality of communications signal carriers to use when transmitting at least part of the data to the first given transmission target includes selecting a plurality of the individual carriers, for at least a portion of a next transmission opportunity, to use when transmitting to the first given transmission target; and

- selecting a second modulation and coding scheme to use when transmitting at least part of the data to the second given transmission target includes selecting one of the individual carriers, for at least a portion of a next transmission opportunity, to use when transmitting to the second given transmission target.

~~30.~~³⁴ (Currently amended) A method for facilitating adaptive transmissions comprising:

- providing data to be transmitted;
- determining that the data includes first data to be transmitted to a first transmission target and second data to be transmitted to a second transmission target;
- determining whether likely trustworthy channel quality data is obtainable for each transmission target;
- when likely trustworthy channel quality data is not obtainable for a particular transmission target, selecting a first modulation and coding scheme based upon an overall average channel quality indicator for the plurality of communications signal carriers to use when transmitting at least part of the first data to the first transmission target ~~determining at least whether, how, and when to transmit at least a portion of the data to that particular transmission target pursuant to a first transmission selection mode;~~
- when likely trustworthy channel quality data is obtainable for a given transmission target, at least attempting to obtain the corresponding channel quality data;
- when the channel quality data is obtained, using at least a channel quality indicator information for at least some individual carriers to select a second modulation and coding scheme to use when transmitting at least part of the second data to the second transmission target ~~the channel quality data to determine at least whether, how, and when to transmit at least a portion of the data to be given transmission target pursuant to a second transmission selection mode.~~

~~31.~~³⁵ (Original) The method of claim ~~30~~³⁴ wherein determining whether likely trustworthy channel quality data is obtainable for each transmission target includes obtaining data that tends to reflect at least a channel coherence time attribute of each of the transmission targets.

~~32.~~³⁶ (Original) The method of claim ~~30~~³⁴ wherein when likely trustworthy channel quality data is obtainable for a given transmission target, at least attempting to obtain the corresponding channel quality data further includes at least attempting to obtain the

corresponding channel quality data for each of a plurality of candidate carriers.

~~33.~~³⁷ (Original) The method of claim ~~30~~³⁴ wherein using at least a channel quality indicator information for at least some individual carriers to select a second modulation and coding scheme to use when transmitting at least part of the second data to the second transmission target ~~the channel quality data to determine at least whether, how, and when to transmit at least a portion of the data to be given transmission target pursuant to a second transmission selection mode~~ includes matching transmission targets to candidate carriers, which carriers appear to be better suited to support transmissions to the corresponding matched transmission target.

~~34.~~³⁶ (Original) The method of claim ~~33~~³⁷ wherein matching transmission targets to candidate carriers includes considering matching multiple candidate carriers to a particular transmission target to thereby facilitate use of multiple candidate carriers when transmitting data to the particular transmission target.

35. (Cancelled)

~~36.~~⁴⁰ (Currently amended) The method of claim ~~35~~³⁹ wherein determining the channel coherence time attribute for a multi-carrier channel includes directly measuring a speed of movement of the mobile communications unit.

~~37.~~⁴¹ (Currently amended) The method of claim ~~35~~³⁹ wherein determining the channel coherence time attribute for a multi-carrier channel includes at least estimating a Doppler power spectrum.

~~38.~~⁴² (Currently amended) The method of claim ~~35~~³⁹ wherein determining the channel coherence time attribute for a multi-carrier channel includes comparing channel frequency response as determined at differing times.

~~39.~~¹⁴ (New) The method of claim 1, wherein the at least one subband channel quality indicator comprises a plurality of subband channel quality indicators.

~~40.~~¹⁵ (New) The method of claim 1 wherein the determining whether likely trustworthy channel quality data is obtainable comprises receiving a message from a mobile unit indicating a channel coherence time attribute status of the mobile unit.

~~41.~~¹⁶ (New) The method of claim 1 wherein the determining whether likely trustworthy channel quality data is obtainable comprises assessing at least one of an expected average and an maximum speed of the at least one transmission target.

~~42.~~¹⁷ (New) The method of claim 1 wherein when likely trustworthy channel quality data is obtainable, receiving a channel quality report comprising one or more subband channel quality indicators comprises receiving a channel quality indicator for a most favorable quality subband.

~~43.~~¹⁸ (New) The method of claim 1 wherein the channel quality report is received not proximal to the beginning of a downlink frame boundary in a TDD system.

~~44.~~¹⁹ (New) The method of claim 1 further comprising selecting at least one of a first antenna for transmission according to the first modulation and coding scheme, and a second antenna for transmission according to a second modulation and coding scheme.

~~45.~~³⁹ (New) A method for use by a mobile communications unit that communicates in a multi-carrier system, comprising:

determining a channel coherence time attribute for a multicarrier communication channel in a multicarrier communication system;

determining an identification of the mobile communications unit as one of a first type and a second type based on the coherence time attribute;

transmitting a message indicating the classification made by the mobile communications unit;

in response to the identification being of the first type, determining a band-average channel quality for an overall bandwidth of a multicarrier communication channel, and transmitting the band-average channel quality; and

in response to the classification being of the second type, determining a channel quality for at least one subband within the multicarrier communication channel, wherein a subband comprises at least one subcarrier, transmitting the channel quality for the at least one subband, and transmitting a corresponding subband index for the at least one subband.

~~46.~~ ⁴³ (New) The method of claim ~~45~~, ³⁹ wherein
the determining a channel quality for at least one subband comprises determining a channel quality for each of a plurality of subbands within the multicarrier communication channel;

the transmitting the channel quality for at least one subband comprises transmitting the channel quality for each of the plurality of subbands; and

the transmitting a corresponding subband index for at least one subband comprises transmitting a corresponding subband index for each of the plurality of subbands.

~~47.~~ ⁴⁴ (New) The method of claim ~~45~~ ³⁹ wherein at least one of (a) the identification and channel quality, and (b) the identification and channel quality and subband index, is transmitted in a single message.

~~48.~~ ⁴⁵ (New) The method of claim ~~45~~ ³⁹ wherein
the determining a channel quality for at least one subband comprises determining a channel quality for each of a plurality of subbands within the multicarrier communication channel, and identifying a favorable quality subband from amongst the plurality of subbands;

the transmitting the channel quality for the at least one subband comprises transmitting at least the channel quality for the favorable quality subband; and

the transmitting a corresponding subband index for at least one subband comprises transmitting a corresponding subband index of at least the favorable quality subband.

~~49.~~ ⁴⁶ (New) The method of claim ~~45~~ ³⁹ wherein
the determining a channel quality further comprises determining an integer channel quality indicator corresponding to a modulation and coding scheme index; and
the transmitting the channel quality comprises transmitting the integer channel quality indicator corresponding to the modulation and coding scheme index as the channel quality.

~~50.~~ ⁴⁷ (New) The method of claim ~~45~~ ³⁹ wherein the determining the identification of the mobile communications unit as one of a first type and a second type based on the coherence time attribute comprises comparing the coherence time attribute to a breakpoint threshold value to determine the classification of the mobile communications unit.

~~51.~~ ⁴⁸ (New) The method of claim ~~45~~ ³⁹ wherein a number of subcarriers in the at least one subband is not more than half a number of subcarriers in the multicarrier communication channel.

~~52.~~ ⁴⁹ (New) The method of claim ~~45~~ ³⁹ wherein a number of subcarriers in the at least one subband is greater than one.